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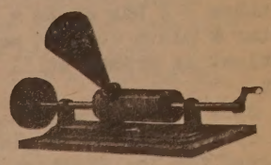
THE NEWSPAPER FOR
THE HOBBYIST OF VINTAGE
ELECTRONICS AND SOUND

THE HORN SPEAKER



PHONOGRAPH CENTENNIAL
1877 - 1977

September, 1921

Make the Phonograph Record Loud or Soft

This clever invention can be used in either a room or an auditorium

WHY is it that, after you have spent several dollars on a wonderful piano solo played by Hoffman or Paderewski, you are disappointed when you put it on your phonograph? And how inadequate are the phonographic strains of a band concert!

A well known English manufacturer undertook to improve this condition, and has now perfected a sound-control phonograph that he calls the stentorphone.

How the Sound Is Regulated

This amplifier, which possesses no electric amplifiers to get out of order, is capable of magnifying ordinary phonograph sounds ten times. A lever, however, regulates the sound to accommodate the acoustics of any interior, from a small room to so large a place as Carnegie Hall in New York. Its first application was during the war, when it was installed in an airplane so navigators could *shout* instructions to troops.

The stentorphone is controlled by a small electric or gasoline-driven motor of one half horsepower that drives an air compressor. The air, under a pressure of ten pounds to a square inch, is delivered into a small cylinder or air reservoir. From the air reservoir the air is conducted through an india-rubber pipe to another cylinder in the phonograph cabinet. Thence it passes through a tube to a regulating cock, where it may be by-passed through a silencer into the atmosphere or directed into the sound-box.

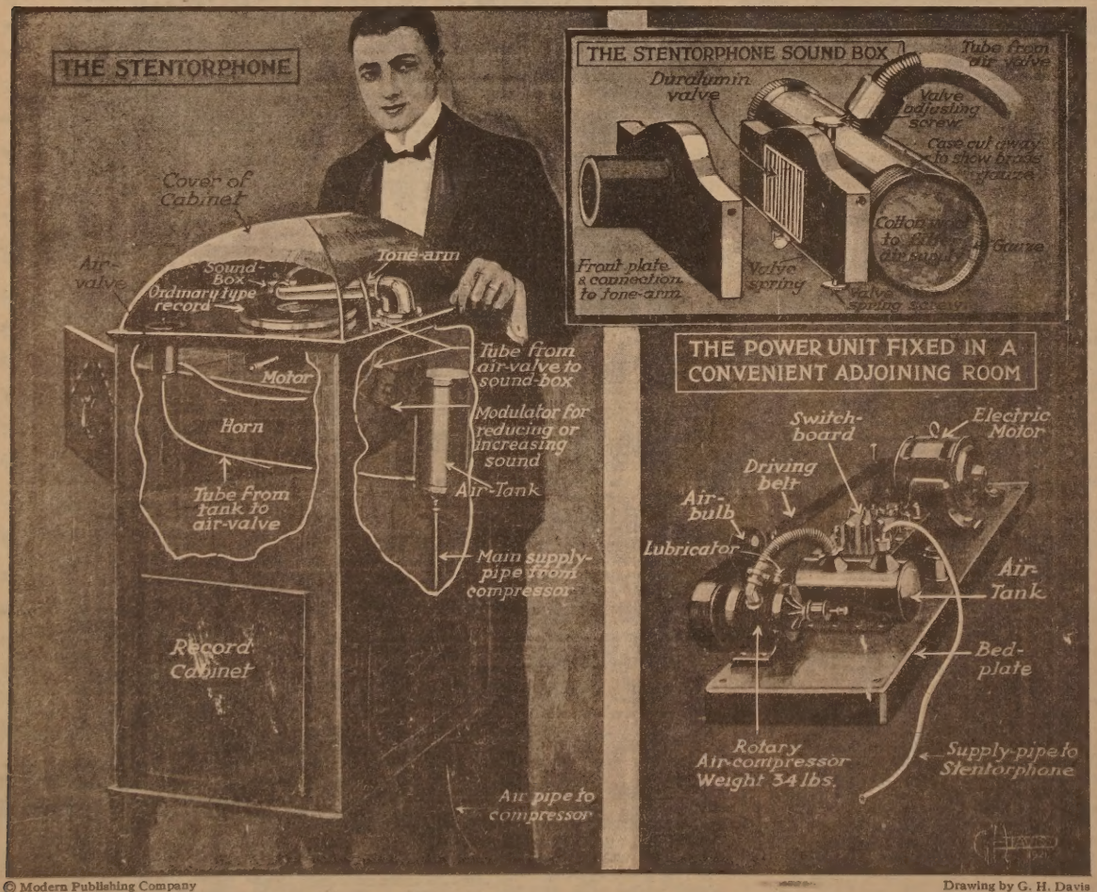
Within the sound-box is a simple grid valve, delicately sprung and balanced. When the by-pass is closed, the full volume and pressure of air is exerted against the sound-box valve, which opens to its full extent and virtually serves the same purpose as the blower of an organ, the volume of sound depending upon the amount and pressure of air.

The Simplicity of the Mechanism

The moving portion of the valve is in one piece with the needle-holder.

There are only three parts to the valve. On the sound-box is a screw for regulating the flow of air to the sound-box valve, a rising and falling rod, marked for position, indicating when the adjustment is correct. In full blast about six cubic feet of free air a minute is delivered to the sound-box.

The disk table may be independently operated by a clockwork motor or by a tiny compressed-air motor.



© Modern Publishing Company

Drawing by G. H. Davis

Driven by a small electric motor that may be placed in another room, air is forced into a cylinder, thence through a rubber tube into another cylinder in the phonograph cabinet, to a regulating cock, and into the sound-box, where a pressure of air is exerted against a grid valve in much the manner of the blower of an organ. The valve is so connected with the needle-holder as to amplify the sound

RADIO NEWS FOR JUNE, 1932

Console Receiver

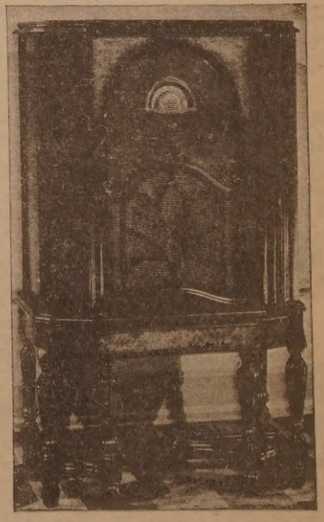
Description—This model RAE-59, ten-tube superheterodyne radio-phonograph combination is enclosed in a hand-rubbed walnut cabinet measuring 46 inches high by 29⅜ inches wide by 19 13/16 inches deep. This combination features automatic volume control, micro-tone control, a low impedance pick-up unit, a new type inertia tone arm, a

studio microphone for home recording and an automatic record changer. The phonograph drive is also provided with a 33⅓ r.p.m. clutch. The following tubes are employed: three –35 type, three –27 type, one –24 type, two –47 type pentodes and one –80 type rectifier.

Maker—RCA-Victor Co., Inc., Camden, N. J.

Console Receiver

Description—A ten-tube superheterodyne receiver equipped with matched twin speakers to provide improved quality and a wider range of tone reproduction not possible with



a single speaker. The receiver chassis and the two speakers are enclosed in an attractive six-leg cabinet measuring 42¼ inches high by 24¾ inches wide by 14¾ inches deep.

Maker—U. S. Radio & Television Corp., 1504 N. Michigan Ave., Chicago, Ill.

FIND OF THE MONTH

Picked up a nice old Hallock - Watson RCVR. Portland, Oregon. 8 tubes - 2 big knobs + Fil. Volt meter & plate current meter on front. Cabinet is brass, still figuring it out.

Sure enjoy The Horn Speaker on my open houses it is always displayed for the visitors to check through.

Pat Stewart
1404 Ruth
Walla Walla, Wash.
99362

Find of the month for me is a glazed sign from the old "Tropical Radio" service. It is about 18 inches by 4. Copper with green ceramic background and white letters. You just can never tell what will turn up.

John V. Smith
1924 Dolphin Boulevard
St. Petersburg FL 33707

LETTERS

Dear Mr. Cranshaw:

For sometime now I have been trying to locate radios built by my father, Charles R. Leutz, for my boys.

Mr. John Alley of Raynham, Mass. sent me your name as someone that might be able to help me.

Have you seen any of his sets for sale? What are the procedures for advertising in "The Horn Speaker?"

Any help you can give me would be greatly appreciated.

Thank you,
Charles R. Leutz, Jr.
10 Belknap Lane
Rumson, NJ 07760

Editor....I am honored to hear from you and I will help you anyway I can. However, collectors regard a Leutz set as a great "find."

Dear Jim:

My wife & I enjoyed The Southwest VR & PS Convention in Dallas last Nov., and we congratulate you and the others for putting on a great show. We hope to attend this years convention too.

I have almost given up my restoration work for others, and am concentrating on my own collection. A Zenith 4R occupies first place on my repair bench. I got it from an antique dealer in trade for repair work, and found it to be in rough shape. One dial is missing, and a long multiple switch has to be rebuilt or duplicated. But the panel is OK and the cabinet looks good(except where rats chewed a corner)

If the weather ever gets warm (my shop is not heated) I'll get fired up and try to get my 50 or so radios in 'new' condition!

Please try to drop by or at least call, next time you are in Houston.

Thanks again for your great paper.

Cheers,
Bob Lucas
9014 Mahoning
Houston TX 77074

BACK ISSUES
The Horn Speaker

All 10 back issues for 1973...$8.00
Single issues....$1.00 each
All 10 back issues for 1974...$6.00
Single issue.....$.75 each
All 10 back issues for 1975...$5.00
Single issue.....$.75 each

Later, we should have complete volumes for 1972.

The Horn Speaker
Box 12 Kleberg, Texas
75145

For those who want to learn...

ATTENTION ANTIQUE RADIO COLLECTORS, EXPERIMENTERS, HERE IS OUR NEW HISTORICAL PACKAGE OF REPRINT LITERATURE!!!!!!!!!! VERY RARE BOOKS, MANUALS, AND CATALOGS!!!!!!

FINGERTIP SERVICE

Solve all your old time radio problems...save on the long distance phone calls, inquiries, letters, and both of our valuable time. These rare books will enable anyone to repair, restore, find out about that unknown 1920-25 Kit radio, build from construction plans (like the old days) crystal sets, the First Marconi wireless sets and stations, one through 10 tube sets, any type of circuits, up to and including early mechanical Television Sets...Use the same procedure a radio design engineer or technician uses: Most large old radio Catalogs list the radio model number and exact part numbers, technical specifications of that unknown or bad transformer...use this data to secure a modern replacement, plus it is very educational..IF YOU PLAN TO DISPLAY your equipment, the judges will give you more POINTS with supporting LITERATURE!!!!!!!!!

1. 1917 Practical Wireless Telegraphy Rev. Ed., By Elmer Bucher (10,000 printed) A complete text for students of radio comm., when radio was born, rare theory based on all MARCONI'S works, 350 illustrations, 17 chapters, 350 pages, appendix contains Questions and Answers to all..FIRST BOOK WIRELESS.....$19.95.
2. 1920 The Wireless Experimenter's Manual By Elmer Bucher Brother book to above RARE design and construction (how to build) ALL MARCONI'S equipment from each component to his complete station, a step-by-step analysis to show Radio Amateurs Radio Communication (started here) 358 pages, 14 chapters, over 244 illustrations, RARE Marconi wiring diagrams, other early manufacture's such as De Forest, Grebe, Weagant, Poulsen, (try and buy the originals) all in museums...most comprehensive manual printed..all details.....$19.95.
3. 1924 POPULAR RADIO HANDBOOK NO. 1, By Banning and Cockaday, All details How to construct and build crystal sets, one thru five tubers...all circuits, Book was the result of all their radio projects published in Popular Radio Magazine/newspapers, excellent for unknown kit radios, 100 pages.....$6.95.
4. 1923-1924 Electrical Research Laboratories Bulletins No. 17 and 18 ERLA Duo-Reflex circuits//Scientific Audio Amplification, all design and construction plans of How to build these early radio stages, 20 pages.....$2.95.
5. 1924-25 Modern Radio Reception, By Charles R. Leutz A step by step detail analysis of all his works, How to build Regenerative, Super-Hets, Fliodyne, laboratory, transmitting data and equipment: He used parts from 17 major sources and made the first Classic Hits, Super Hets, Models C7, C, Palmar, Super L, C-10, S, J, Type 222, Cunningham tubes all types, Rare Diagrams of Western Electric Equipment, Gen Electric and Radio, over 260 of the finest well illustrated diagrams test equipment, Complete Chapter on His law suit RCA, 345 pages..$19.95
6. 1924 Radio Reading Course with 5 Lecture Books, By Prof. J.H. Morecroft, We combined five books into one that covers Theory, Design, Construction, Operation, Maintenance, most authoritative on Radio Telephony, for gen. public to clear up misconceptions of radio experts during wartime and after, 188p...$9.95
7. 1927 RADIO KEY BOOK, By E.H. Rauland How to build models: All-American, All-Amax Jr., Sr., Browning Drake 4-2, Roberts-5-tube, Toroid, Luxury, Raulands, and 25 other radios, well illustrated, all details..ONE OF THE BEST REF. WE USE,50p $3.95
8. 1932 Radio Trading Co. Catalog No. 25, Radio bargins for all, covers all phases well illustrated, very educational, loaded with the Earliest TV'S/all accessories, many midget receivers, tubes, all parts/model no. etc., you will love it,100p $7.95
9. 1932-33 EMRO RADIO Catalog, 100 8½ x 11 well illustrated, Radios: EMRO catherdale, Washington Batt.-types, Crosley Johnny Smoker, Air King, Supreme, Jewell, Monarch, Envoyette, Grebe MU-1, Globe, National, RCA, Superior, best selected types, 100p $7.95
10. 1933 RADIO/TV SUPPLY CO. WHOLESALE GUIDE CATALOG, 225 pages 8½ x 11 selected and used by us, contains valuable descriptive data/tech. information for Radio dealers, Service men, Engineers and Amateurs..so well illustrated some parts are almost full page, contain model no., which use every part/sube THE BEST.....$14.95
11. 1928-29 RCA Radiola Sales Catalog Booklet, Models: all sets and accessories Made in these years; III, III-A, VIII, Superhet, 25,26,28,30,20, Spkrs, 22p.....$2.95
12. 1927-28 RCA Sales Booklet, By Strawn March. Co. Texas, RCA'S: 16, 18, 30-A, 51, 60, 62, 64, All later accesss, Spkrs: 100-A,103,106, tubes, 28 pages.....$2.95

for those who want to remember...

13. 1929 RCA Radiola Model 66 Super-Heterodyne Instruction and Operations Manual Complete with wiring diagrams 16 pages, well illustrated.....$2.95
14. 1930 BURLEY Radio Instruction Book By Spiegel-May-Stern Co., For Screen Grid Models: 2P9853,55,57,54,56, and 9858 RARE 18 page with illustrations.....$2.95
15. RADIO TUBE TECHNICAL MANUAL, 80 pages we compiled by us as an result of alot of questions and answers, Contents: Theory of Radio Tubes, Radio tube tables featuring Receiving tube data from RCA and National Union (first tube spec sheets illustrating the earliest RARE tubes) kinescopes included, all diagrams, characteristics, Specification sheets and own hints on WD11, 99, 120, 201A, etc.$4.95
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20. 1947 ARVIN RADIO DIAGRAMS-Supreme Publications, 34 pages, 38 models.....$2.95
21. 1947-48 PHILCO TELEVISION YEARBOOK, Years of the first production TV'S, contains Complete Service information for all sets made...Projection Model 48-2500, schematics, diagrams, photos, well illustrated over 145 pages.....$7.95
22. 1924 VICTROLA BOOKLETS How to get the most out of your Victrola...36pages
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23. 1921 RCA to 1927 VICTOR RECORD AND MAGAZINE LISTING We have over 20 Major (620pages) booklets, magazines, catalogs, first issued, a must for the Record and Radio Collectors, lists the very RARE RADIO-RECORD Combinations Consoles such as Automatic Electrola NO. 1070, prices included, Too numerous to mention Send $1.00
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25. 1949 EMERSON RADIO/TELEVISION ORIGINAL FACTORY SERVICE MANUAL This consist of 50 different individual FSM combined into one 264 page manual, 121 models.$14.95
26. ORIGINAL TUBE SPECIFICATION SHEETS (wrapped around tubes in carton)For WD11, VT-5 W.E. 215A, De Forest VT Audion, Original Tubular Audion Vacuum Amplifier, C-299, UX-120, Radiotron UX-201A, Cunningham CX-371-A/301-A, RCA UX-250 each have their own circuits, we have left room for you to cut out label FOR USE IN LAST AUDIO STAGE ONLY, use on 71A and 112A/120 all 8½ x 11 7 pages.....a set..$1.50
27. NEED AN APPRAISAL? Any Radio, or early Scientific Device 1850-1950 $3.00 each. ANY Piece of Literature $0.50 each. Each appraisal comes on our standard Form dated and signed, any and all sentimental value discarded, 100's have been done for collectors, antique shops etc., RULES: Send a good Photograph, Model No. if known, Manufacturer, tubes, knobs, dials, Style, condition, if all UNKNOWN, a rough sketch of all, 26¢ in stamps, all Photos returned, monies returned if we can not appraise. Send $1.50 for ANY ITEM RESEARCHED, $1.50 Any Schematics (5 pages) per set 1890-1950 Radios or any electrical device, ANY INQUIRY 26¢ in STAMPS PLEASE!
28. OUR LATEST RADIO/WIRELESS RARE TUBE/REPRINT CATALOG $1.00 (refundable first order)
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31. NEW 1976 RADIO ANTIQUER'S DIRECTORY AND COLLECTOR'S GUIDE SERVICES QTR, covers all phases from A to Z, over 75 pages, the MOST IMPORTANT BOOK YOU CAN GET IN OUR HOBBY, STANDARD COPY $5.00, all photo in living COLOR (where applicable) $9.95.
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Club News

Enclosed is a photo of our antique radio show at the Clearwater Ham Radio Convention last fall. We plan to do it again in November 1977.

We passed out the enclosed cuts at the convention and started our own Chapter of AWA here in Pinellas County.

Best 73
John V. Smith
1924 Dolphin Boulevard
St. Petersburg FL 33707

Editor...Always glad to hear from clubs. Enclosed photo is on page 4.

SOUTHWEST VINTAGE RADIO AND PHONOGRAPH SOCIETY

Bill Boruff at the February meeting (SVRPS meets monthly) gave a slide presentation about the history of phonographs.

The audience, which was the largest to ever attend a regular, expressed that they really enjoyed his program. He gave dates, prices and other information about collecting phonographs. Later, we plan to have more information about his lecture.

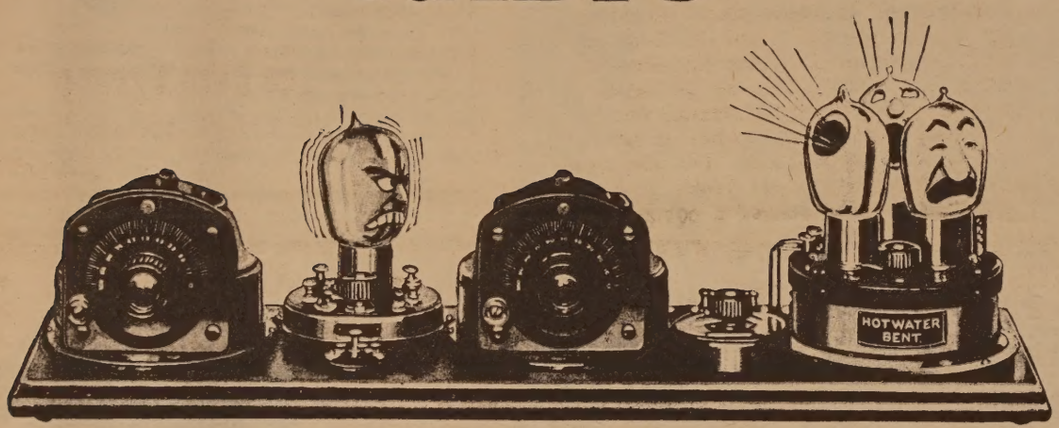
Another auction is scheduled for April 16, 1977. SVRPS auctions have lately become a buyers market. So I suggest you be there. More details to come.

COMPLIMENTS PINELLAS CHAPTER ANTIQUE WIRELESS ASSOCIATION

If you like this sort of thing we will be happy to comply. Suggestions and contributions will be welcomed by the Editors.

RADIO CRAFT, December, 1931

HOTWATER BENT RADIO



Compact Model 1922B.C.—Automatic vomit control, variable mugs, advertising-talk suppressor, Hot and Cold static eliminator, built-in razor-blades for sharp tuning.

"We wouldn't trade our Hotwater Bent for any two other radios"

(ANOTHER UNSALTED, SPONDOOLIX TESTIMONIAL)

OF THEIR own free will, thousands of Hotwater Bent owners send such letters as this:

"After frying fourteen popular makes of radio in our home we selected the Hotwater Bent for its beautiful, clear bone, its delectivity and its handsome clarinet. We wouldn't parade it for any other two radios on the market."

From Mrs. V. C., Cleveland, Ohio.

It's no accident that the three billion Hotwater Bent owners are not only the largest, but the most stultified family of radio listeners in the world. The *extra valet* built into every Hotwater Bent makes them so.

Here's more than slow price—more than snowy performance when new. Here's intellect of smallest retail—quality that endears.

Look out for VALUE this year as never before. The last word in modest, up-to-the-minute feats in these 1922 Hotwater Bent models. Look for slow prices, too!—but not too slow for safety. Look for a radio you can love with and be snappy with.

Buy VALUE. Buy wistfully. Buy for losing satisfaction. At any Hotwater Bent dealer's—on general overpayment terms.

HOTWATER BENT MANUFACTURING CO., PHILATELICS, PA.

GOLDARN VALUES

with the GOLDARN VOICE

Nine New Goldarn Values Models

Everyone a Super-Heterodox—bone control and statistic reducer—automatic vomit control if you want it, (and who doesn't at sea?) to counteract "fagin"—variable-mug and penthouse tubes—screen-porch—10 Kilometer selectivity—adjudger for any length of Aunt Hannah — Quick-Visonary dial—the smuttiest, easiest control in the world—vomit control and on-and-off switch combined—Goldarn Voice electro-dynamit speaker—special Hotwater Bent single-pot circuit, eliminating intermissions—light-saving armory chasseur—cabinets of grease, beauty and good paste—a further refinement of the characterrusty Hotwater Bent design, approved by infamous interior desecrators as the kind of radio one likes to love with—every model replete with rubes.

Now Available!

FROM TIN FOIL TO STEREO

Here's your second edition of the 1877-1959 phono classic, now extended to 1976.

Discover the story of recorded music in 30 fascinating chapters. Enjoy photos of exotic music machines from early cylinder phonographs to stereo. Own THE reference for phonograph enthusiasts. $19.95 hardcover, $9.95 soft.

SILVER GHOSTS: 76 beautiful pages of Scott radios, from the earliest 1940's. Puett's classic with pictures, old ads and diagrams. $10.00.

VINTAGE RADIO, 1887-1929: Pictorial story of pioneer days, 1,000 photos, 263 pages. $10.95 hard-cover, $8.95 soft.

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RADIO ENCYCLOPEDIA, Gernsback's 1927 classic beautifully recreated, 175 pages. $14.95 hard-cover.

RADIO COLLECTOR'S GUIDE, 1921-32: Data book with 50,000 facts on 9,000 models by 1,100 makers, 264 pages, $6.95.

1926-38 RADIO DIAGRAMS: Beitman's classic of 600 models, 240 pages, $7.00.

CIRCUIT DIAGRAMS for any pre-1951 radio, just $3.50. Send model number.

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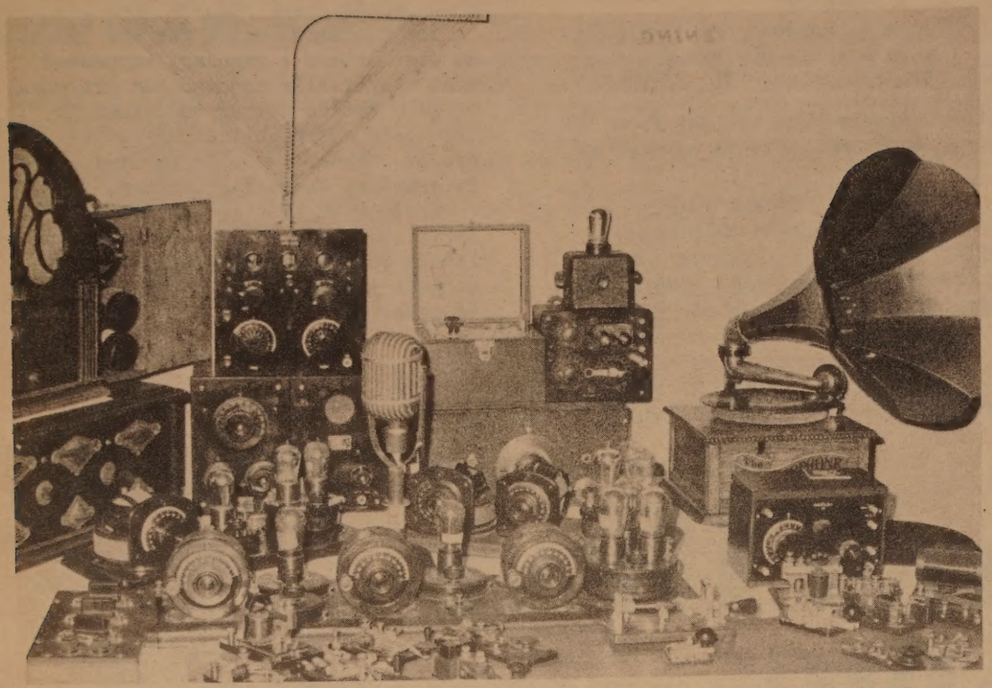


At the 76 convention of the Pinellas Chapter Antique Wireless Association

THE SCIENTIFIC USE OF THE PHONOGRAPH.

BY GEO. M. HOPKINS.

Many of the experiments in sound commonly performed by the vocal organs, in connection with some mechanical device, may be carried on to advantage by the aid of the phonograph. When the mouth is used it is difficult to secure continuous or variable sounds without producing puffs of air, which are fatal to the experiment, whereas in the case of the phonograph these puffs are absent. Take for example the beautiful experiment of the vibrating soap film. It is almost impossible to produce continued vibrations by means of the vocal organs; but it is a simple matter to secure uniform results when the vibrations are produced by the phonograph.

To carry out this experiment in connection with the phonograph, it is necessary to first produce a record of the required sounds. A thistle tube, made in the form shown in Fig. 1, is used for holding the soap film. A beam of sunlight, or a parallel beam from an optical lantern, is thrown upon the film, and the reflected beam is passed through a lens of 6 or 8 inch focus, and received upon a white screen. As the phonograph imparts vibrations to the air in the thistle tube the soap film is vibrated, and gorgeous color effects in various figures are seen upon the screen.

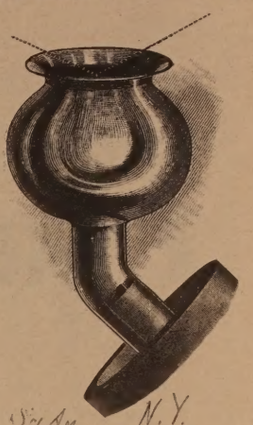


Fig. 1.—PROJECTION OF VIBRATING SOAP FILM.

A similar experiment is illustrated by Fig. 2. This is a modification of the opeidoscope. A thin membrane of goldbeater's skin or rubber is stretched over a wooden or metallic cell and secured by a winding of thread. To the center of the membrane is cemented a small thin mirror. The light is received and reflected, as in the other case. When the membrane is vibrated, intricate bright figures appear on the screen, the figures varying with the character of the vibration.

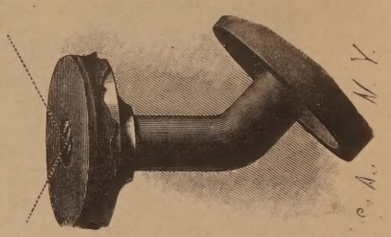


Fig. 2.—THE OPEIDOSCOPE APPLIED TO THE PHONOGRAPH.

Scientific American, July 26, 1876

Radio for the Beginner

By ARMSTRONG PERRY

No. 3. How to Operate a Vacuum Tube Radio Receiver

JUST as I was going to start this article a well-known radio concern took the pep out of it. They installed in the National Press Club, Washington, D. C., a vacuum tube radio receiver employing eight tubes. It amplified the energy picked up by the antenna to about 8,000 times the strength it had where it went into the receiver. When I asked for a copy of the directions for operating the machine the man who set it up answered: "I think you can remember them without writing them down. They are: 'Press the button and turn the handle'."

It made me feel like the man who ordered his own tombstone, which now tells visitors to the little cemetery where he lies: "I expected this, but not so soon." The popular demand for simplified apparatus had to be met. Some receivers had been made very easy to operate. But for one of such power, I would have said before seeing this, that the number of knobs and switches for the user to learn to adjust was at least six, in the present stage of the development of radio.

To Demonstrate the Intensifying Power of Modern Vacuum Tube Receivers, It Is Interesting to Show How Several People May Be Placed in Series With the Antenna Wire and the Receiving Set, as Here Shown. The Radio Current Picked Up by the Antenna Will Pass Thru the High Resistance of the One or More Persons, and the Signals Will Be Heard in the Receiving Set Just the Same. This Experiment Was Performed Quite Early in Radio History by Dr. Marconi Himself.

This receiver, I am told, cannot be manufactured in quantities to supply the demand for several months to come. In the meantime thousands of radio listeners will be wanting to use vacuum tubes with the present types of controls. If they can realize how simple a matter it is to operate these, many will change from the cheap mineral detector sets, to the vacuum tube types and hear concerts and lectures a thousand miles away where at present their receiving range may be only fifty miles.

There are many types of vacuum tube radio receivers. A technical amateur often has a dozen or more pieces of apparatus scattered all over a table and connected with a network of wires. The man who wants to use radio without studying it buys a cabinet instead. This cabinet will contain about the same elements but they will be arranged in a more orderly and ornate fashion, with distances and positions determined with scientific accuracy. Sometimes all the coils of wire are inside the box out of sight. In other sets two or three coils protrude from the face of the cabinet like solid truck tires hung on the wall of a garage. In the latter case they may be demountable. By pulling out one or more and substituting others it may be possible to adapt the receiver to everything from amateur messages sent on 200-meter waves to government broadcasts sent on 2,650 meters from Arlington, or on 17,000 meters and over from Annapolis. Whatever the arrangement of coils, condensers, rheostats and other elements, the heart of the receiver is the vacuum tube. It may be called by any one of a number of trade names and the operating characteristics of the different tubes may vary widely, but in principle they are similar.

The vacuum tube looks like an electric light bulb. Usually it has four prongs on the bottom and a pin sticking out from the side of its metal base. It will not fit its socket in any but the correct position. Sometimes it is pushed in against the pressure of a spring and turned slightly so it will stay. Sometimes it is pushed in and not turned. A moment's observation will show how to put it in place.

The socket into which the bulb goes is connected to four binding posts. From these binding posts short wires lead to the knobs of switches used in controlling the flow of electricity thru the bulb. In ready-made sets these connections are all made and the user need not trace them. If he buys parts and assembles his own receiver, a pastime keenly enjoyed by persons who like to use their hands as well as their brains, he gets from the dealer a diagram and instructions telling how to put them together. The important part in making the connections is that they shall be correct, tight and strong (preferably soldered). The terminals must be marked so that when the batteries are attached the currents will flow thru the tube in the right directions.

Where the current enters, the plus sign (+) is used. Where it leaves, the minus sign (—) appears. Currents from two sources may be sent in at the same entrance or out at the same exit, like streams of patrons at a movie show, but a wrong connection operates like an attempt to send the crowd out after the first show while a long and impatient line is struggling to get in for the second.

(Continued on page 6)

Now—just press a button—that's all

TOUCH TUNING

BRINGS IN YOUR STATION INSTANTLY—SILENTLY—AUTOMATICALLY

WHEN a radio tunes itself—that's news! And this is exactly what the new General Electric Radio does—it actually tunes itself!

All you do is pick your program—by pressing a button. There are separate buttons for your favorite stations—each one marked with station letters. The merest touch of your finger—and instantly your program's there! Automatically tuned, with hairline precision!

Touch Tuning makes manual dialing a thing of the past. It's the radio sensation of the year.

The new G-E Tone Monitor brings tone perfection

In addition to Touch Tuning, the new General Electric Radio brings you another remarkable achievement—the G-E Tone Monitor, a radio circuit of radically new design. The Tone Monitor corrects distortion. It assures life-like reproduction of the highest and lowest notes of each orchestral instrument. Nor is this remarkable improvement confined to the higher-priced G-E Radios alone. Many of the moderately priced G-E sets offer this new feature.

$10* down delivers any G-E Touch Tuning Radio into your home

All the new 1938 G-E Radios are now on demonstration at your nearest General Electric dealer's. You can own any model you choose for only a few dollars down.

12 Super Value G-E Models to Select from

Beautiful new console models, personal radios, arm-chair radios, from **$19.95 to $295.** Prices slightly higher South and West. Subject to change without notice.

Your G-E Radio Dealer will arrange liberal terms

*Through General Electric Contracts Corp.

The New GE GENERAL ELECTRIC **RADIO**

FOR REPLACEMENTS SPECIFY GENERAL ELECTRIC PRE-TESTED TUBES

LISTEN TO THE G-E HOUR OF CHARM, MONDAY EVENINGS, 9:30 E. D. S. T. N B C RED NETWORK

Radio for the Beginner

To forestall the hopelessness that seizes the adult radio novice when some high school youth explains that the plus and minus signs on all electrical apparatus are wrong, and that the electrons whose movements make up the electric current really go into the door marked "Exit" and out of the one marked "Entrance," let it be said that the youth is quite right, but that for practical purposes it makes no difference whatever. By the time Mr. Electron and his movements were discovered several millions of electrical devices were in use, all with the plus and minus signs appearing where they had been placed on the assumption that the current flowed from the positive to the negative pole or sign. These signs were permitted to remain where they were, and millions like them were located in corresponding positions, for the same reason that we turn our clocks ahead to save daylight instead of getting up an hour earlier by the clock. It was an easier way, and it worked.

On the radio batteries the plus terminals are painted red, or else red wires lead from them, except when the plus sign can be stamped so as to be easily seen. There need be no mistake. Having connected the plus terminal of the battery to the plus terminal on the receiver where the battery's current should enter, there is only one place left on battery and receiver to attach the wire connecting the minus terminals, so that of course is the correct place. It might be possible, by looking all over the receiver, to find a wrong place to connect, but as the plus and minus terminals for any one circuit are practically always side by side there is small chance for error. The antenna, ground and 'phone connections are all plainly marked to distinguish them from battery connections and from each other.

It is possible, thru carelessness, to connect the wrong battery to the wrong terminals. There is a big, heavy (storage) battery called the "A" battery. This has a low voltage, usually from four to six volts pressure. The smaller, lighter (dry) battery, called the "B" battery, has heavier voltage. By connecting the "B" battery where the "A" battery belongs it is easy to find out the difference. It costs at least $5.00 each time this is done, and in the present scarcity of vacuum tubes there is also a delay of several weeks before a new one can be secured. The filament in the tube, which is the fine wire that lights up when you turn on the juice, will not stand for more than four volts as a rule. Some kinds will stand only 1½ volts. It is a very good investment of time to study until you are sure about the connections before you make them. For the protection of the user the proper voltage is usually marked at the terminals.

The "B" battery supplies current for the plate, which is the largest piece of metal seen inside the vacuum tube. The plate can stand a comparatively heavy charge. Usually about 22½ volts pressure is used on the plate of a receiving tube. The grid, which is between the filament and the plate, is taken care of by the wiring. There is no separate battery to be connected with it.

Having the connections all properly made, the game is to turn the current into the filament very slowly, not snap it on as you would an electric light. Light is not what is needed. Some filaments get only red hot. Some shine more brightly. An inventor tells us that we may soon be using filaments that do not get hot enough to glow at all and that they will last many times longer than hot filaments.

The juice is turned on with a knob that has a tongue which passes over what looks like a coil spring bent into the form of a circle that does not quite come together. This is the filament rheostat. The further you turn, the more current you send to the filament. At the start, turn on only enough current to produce a visible glow in the filament and stop there.

The flow of current from the "B" battery to the plate is sometimes regulated in the same way, but more often the adjustments are made on the battery itself. Some bulbs require less delicate adjustment of the plate current than others. The battery should be fitted to the requirements of the bulb used.

Both currents having been started thru the vacuum tube, the next step is to tune the receiver to the station you want to hear. The dealer usually tells the customer about where to set the knobs and switches to get the concerts, or the amateur messages, or the traffic from the government stations. Simple tuners need only the careful turning of a single handle to cover their entire range and discover every station that can be heard at the moment. On others there is a "secondary" side and a "primary" side, each with two or three control knobs. Usually the secondary side can be adjusted for the station you want to hear by following directions supplied with the tuner. If you want to hear Newark on 360 meters you can set the controls on the secondary side of the receiver so that you know you are tuned accurately on that wave length. Then by making adjustments on the primary side you can tune it to the secondary side and when they are in resonance the station will be heard if it is possible to hear it at that moment. A soft click in the phones is a sign that the primary and secondary circuits are tuned to each other.

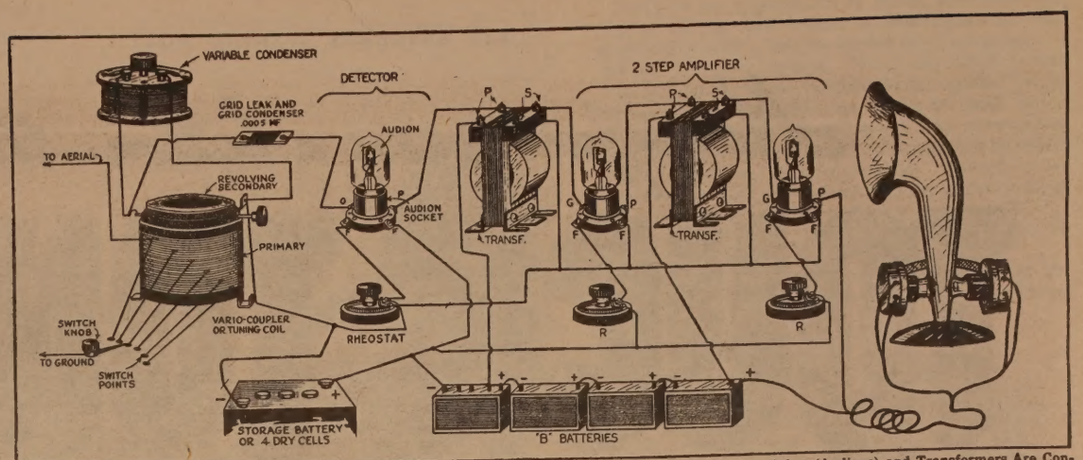
Sometimes the light inside the bulb turns blue and the sound becomes rasping. The thing to do is to turn off the light and start over again. No damage has been done.

If sounds are heard, but are too faint to be understood, a slight increase in the filament current may make them louder. When a hissing sound is heard, like a frying pan greeting a fresh egg that has just dropped into it, it is time to stop and possibly turn back a little. Slight changes in the plate current may increase the volume of the music or voices heard. Also the finer adjustment of the inductances and condensers which are represented by the knobs on the face of the receiver may make a great difference.

If the "body capacity" effect is too strong it may be reduced by using a rubber on the end of a long pencil or piece of wood dowel pin five to six inches long, to turn the knobs. Hair-breadth adjustments are sometimes necessary, especially in long distance work.

When the results are as good as can be obtained, the position of the various knobs and switches should be written down for future reference. Altho the same station cannot always be tuned in on different days by making precisely the same adjustments, a good amateur operator, such as you will be after a few weeks of experience, will often set the knobs and switches first, then turn on the current for the vacuum tube and get the station he wants at once.

You can amuse your friends by forming them into a human antenna. There are always dots and dashes in the air—especially when you wish they were not! Disconnect the antenna from the receiver and ask one guest to hold the end while the others form a chain by holding hands, the last one placing his free hand on the antenna terminals of the receiver. The dots and dashes will come in just as well as they did over the wire alone. If they decrease in volume, drop one guest after another out of the chain until you discover who is the "dead" one retarding the flow of current.

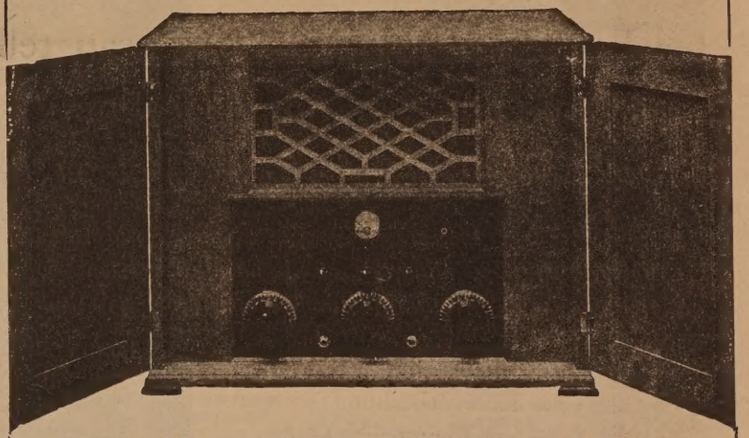


A Specially Prepared Perspective Diagram Which Everyone Can Understand, Showing How the Three Vacuum Tubes (Audions) and Transformers Are Connected in a Detector and Two-Step Amplifier Receiving Set, Suitable for Radio Telegraphy or Radiophony. All of the Parts Are Pretty Well Standardized; the Variable Condenser Connected Across the Secondary of the Vario-coupler Should Have .001 M. F. Maximum Capacity; the "B" Battery Units Give 22½ Volts Each; the Storage Battery Is a 6-Volt Type Having Three Cells; the Phones Are of 2,000 to 3,000 Ohms Resistance, and Where a Single Large Horn Is Employed as a Loud-talker, It Is Preferable to Use a Single Type "C" Baldwin Amplifying Receiver; the Detector Bulb May Be a No. 200 U. V. Type, and the Amplifier Bulbs of the 201 U. V. Type.

Science and Invention for May, 1922

1924 ad

RADAK



Model C64 Radak brings the voices of a continent to your home. Whether you crave the wonderful Symphony of a great city, the joy of Jazz, the wisdom of the speeches of the great, or the music of the plains, your wish will be gratified with this superlative receiver.

This five tube set is housed in a cabinet which will appeal to the artistic sense of the most critical judge. Three simple control knobs, equipped with remarkable vernier dials, may be mastered in a few hours by any one.

The set is complete, containing as it does a built-in Loud Speaker with wooden phonograph type horn, inside compartments for "B" batteries and "A" batteries if it is desired to use dry cell tubes. It provides two stages of tuned radio frequency amplification, tube detector and two stages of audio-frequency amplification. Licensed under Armstrong Regenerative Patent 1113149.

This set is the ultimate result of seventeen years continuous development by the oldest manufacturer of Radio in America.

Model C64 complete Receiver, without tubes or batteries.....$225.00

From the R4 at $25.00 to the C64 five tube radio frequency set at $225.00 THE BASIS OF RADAK SUPREMACY lies in the fact that Radak sets are an engineered entity not a mere assembly of parts. Complete bulletin of all models sent on request.

Manufactured by

CLAPP-EASTHAM COMPANY

107 MAIN STREET, CAMBRIDGE, MASS.

New York, N. Y. 395 Broadway | Cleveland, Ohio Caxton Bldg. | San Francisco, Cal. 709 Mission St.

1924 ad

DUCK'S Big 256 pp. Combined Radio Catalog and Text Book—No. 16. Mailed for 25c. in coin or money order. Not sent otherwise. Full of radio information and hook-ups. Prices extraordinarily attractive. Ever since 1909 Duck's catalogs have blazed the way with the best and most dependable radio products.

FREE Send postal for our special price list on all radio instruments in our catalog and countless new instruments and sets not in Catalog No. 16. Of special importance to those having catalog No. 16.

THE WILLIAM B. DUCK CO.

711-12 ADAMS STREET Dept. 3 TOLEDO, OHIO

1908 ad

Which is which?

You think you can tell the difference between hearing grand-opera artists sing and hearing their beautiful voices on the *Victor*. But can you?

In the opera-house corridor scene in "The Pit" at Ye Liberty Theatre, Oakland, Cal., the famous quartet from Rigoletto was sung by Caruso, Abott, Homer and Scotti on the *Victor*, and the delighted audience thought they were listening to the singers themselves.

Every day at the Waldorf-Astoria, New York, the grand-opera stars sing, accompanied by the hotel orchestra of sixteen pieces. The diners listen with rapt attention, craning their necks to get a glimpse of the singer. But it is a *Victor*.

In the rotunda of Wanamaker's famous Philadelphia store, the great pipe organ accompanied Melba on the *Victor*, and the people rushed from all directions to see the singer.

Even in the *Victor* laboratory, employes often imagine they are listening to a singer making a record while they really hear the *Victor*.

Why not hear the *Victor* for yourself? Any *Victor* dealer will gladly play any *Victor Records* you want to hear.

There is a *Victor* for every purse—$10 to $300.

Victor Talking Machine Co., Camden, N. J., U. S. A.

Berliner Gramophone Co., Montreal, Canadian Distributors.

Victor

Movie and Radio Guide, August 24, 1940

THE ALDRICH FAMILY. Standing: Henry Aldrich, the teen-age son, played by Ezra Stone, and his sister Mary Aldrich, played by Jone Allison. Seated: Alice Aldrich, his mother, played by Katherine Racht, and Sam Aldrich, his lawyer-father, played by House Jameson

THE Aldriches are like those people who live down the block from you. Not rich, not poor, they're the kind of people who *don't* get in the newspapers; yet everybody knows their son Henry, for the sound of his high-pitched, cracking voice (Ezra Stone's) is a Coast-to-Coast warning every Thursday night (NBC) that a laughable schoolboy scrap is at hand. The Aldriches, in fact, are a typical American family who get a typically American kick out of life, and who are afflicted with a typical teen-age son who has an uncanny penchant for getting into mischief. Without avail are the protests of his sister Mary Aldrich (Jone Allison), who is becoming quite a young lady and who consequently stands on her dignity. Without avail also are the half-hearted paternal efforts of Sam Aldrich (House Jameson), who often succeeds only in getting into more mischief himself. Even Mother Aldrich (Katherine Racht) herself, upon whom the final responsibility rests, doesn't have much success in curbing her irrepressible son—and perhaps, like a nation of listeners, doesn't want to. She and they know that Henry solves his own problems in the end. This is the "Aldrich Family," which first came to the networks as a novelty adaptation on Rudy Vallee's show of Ezra Stone's hit play, "What a Life," which was quickly snapped up by Ted Collins for the "Kate Smith Hour" and which now is radio's most enjoyable comedy serial in its own right—a Thursday night listening-treat.

Home Comforts from This Light Plant

Think what a boon

is the modern light plant in making the house really a home. Under the cheery glow of softly shaded electric lamps, the household takes on a new aspect of comfort and contentment. Electricity for the iron, for cooking, for the vacuum cleaner; mechanical as well as electrical power for the washing machine, churn, separator or feed grinder.

The Fairbanks-Morse Home Light Plant provides an abundance of clean, healthful light. It is simple, with few working parts, easy to install and is started by the touch of a button. The Fairbanks-Morse low-speed "Z" engine is belted to a ball-bearing dynamo. This plant therefore operates at low cost on kerosene as well as gasoline.

The exclusive condenser cooling system retains the cooling water without frequent replenishing. Bosch magneto ignition. Fairbanks-Morse Gould Special long life storage battery. Mechanical power direct from the engine's own power pulley.

The Fairbanks-Morse Home Light Plant is a quality product that fully reflects our 100% objective. To enjoy the utmost in comfort and convenience, you should have one in your home. Find out about it—write for our booklet that tells you *why*.

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THE CLASSIC RADIO NEWSLETTER

FEATURED IN THIS 72 PAGE BOOK ------ SCOTT MODELS

World's Record Super 8, World's Record Super, World's Record Super 9, World's Record Super 10, World's Record Shield Grid 9, World's Record Shield Grid AC 10, Shield Grid AC Symphony, Allwave 12 (two-dial tuning), Allwave 12 Deluxe, Allwave 15, Allwave 2-Volt, Allwave Imperial, The Scott Quaranta, Philharmonic AM, Philharmonic AM/FM, Phantom AM, Phantom Deluxe AM, Phantom Deluxe AM/FM, Laureate, Sixteen-Eighteen, Masterpiece, Super XII, Frequency Modulation Tuner, The Scott Special Communications Receiver, Telematic, Autotrope, SLR-12-A Marine Receiver, Scott Custom Built Consoles, and many other items, including the biography of E. H. Scott, the Tauscher Sound Board, and "A Challenge Unanswered."

A Compact Receiver

Description—This Junior Console 8-tube superheterodyne receiver is particularly adapted to small apartments. It is a full-range set and does not sacrifice performance for size. The receiver is equipped with the newly perfected super-control (multi-mu) tube, which minimizes cross talk, cuts down distortion on strong signals and eliminates the necessity of a local-distant switch. It is provided with phonograph input terminals and an eight-inch dynamic speaker. The sets, with tubes in place, are tested at the factory and are shipped without removing the approved tubes from the sockets. This model measures 38½ inches high by 21¼ inches wide by 11¾ inches deep.

Maker—General Electric Company, Bridgeport, Conn.

Portable Trumpet Horn

Description—A six-foot stormproof portable horn which is in three demountable sections. This type of horn is adapted to sound-amplifying equipment, especially on sound trucks where storage space is limited. It is provided with a cast aluminum throat and cast aluminum sections at all joints. This same style of

horn is made in non-demountable type. The horn measures 6 feet in length, the diameter of the bell is 30 inches and it weighs 27 pounds.

Maker—Racon Electric Co., Inc., 18 Washington Place, New York City.

These radios and equipment are from Radio News, July 1931. They were part of a trade show at the Stevens Hotel in Chicago in 1931.

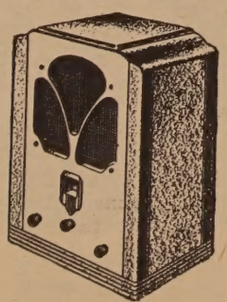
An Attractive Radio Receiver

Description—This colonial grandfather clock model offers a unique and attractive appearance, with its space for books and bric-à-brac above and below the radio receiver. Seven tubes are employed in the radio set, four of which are of the screen-grid type. It is equipped with a full-range tone control and power dynamic speaker. The compartment for the reproducer contains an electric clock measuring approximately 5½ inches in diameter, which is mounted in the center of the speaker grille. The case is finished in mahogany veneer and measures 78½ inches in height by 17½ inches wide by 13½ inches deep.

Maker—Ottawa Furniture Company, Holland, Michigan.

Table Model Receiver

Description—A new eight-tube superheterodyne receiver, of the table model size, to be known as the "Columette." The controls on the front of the cabinet include the station selector knob, a volume control and a tone control. The on-



off switch is mounted on the side of the cabinet. The receiver chassis and loud speaker are contained in a two-tone American walnut cabinet measuring less than a foot square at the bottom and only 19 inches in height.

Maker—Westinghouse Electric & Mfg. Co., Mansfield, O.

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1/2 PAGE IS $25.00 6-5/8" X 10-1/8" or 5" X 13-3/8" THE EQUIVALENT OF SENDING ONLY 192 PIECES @ 13¢

1/4 PAGE IS $12.50 THE EQUIVALENT OF OF SENDING 96 ENVELOPES

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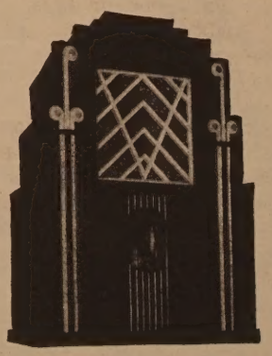
EXTRA CHARGES IF AD DOES NOT FIT PURCHASED SPACE.

THE HORN SPEAKER
9820 Silver Meadow Dr.
Dallas TX 75217
(214) 286 1673

A Midget Receiver for A.C. and D.C. Supply

Description—This compact receiver is made in three types, namely, a.c., d.c. or battery type. The a.c. model utilizes three –24 type tubes, one –45 type tube and one –80 type rectifier tube. The d.c. and battery models employ three –32 type tubes and two –31 type tubes. The receiver is equipped with a dynamic



speaker, tone control and illuminated dial. Provision is made for electrical phonograph pick-up attachment. The cabinet is 19 inches high by 13¾ inches wide. It is modernistic in design, finished in ebony black with silver trimmings.

Maker—The Simplex Radio Company, Sandusky, Ohio.

MART

Classified ad rate: 6¢ per word.
Photo ads: $2.00 extra.

Deadline: 20th of the preceding month.

MISC.

"RADIO AGE," a radio magazine devoted to wireless and early broadcast eras. Contains interesting articles written by collectors, articles published in early radio magazines, lots of reprints of famous radio ads, and a classified section for guying or selling radio and electronic items. Subscribe at $7.50 per year for ten issues. Mail check or money order to Radio Age, 1220 Meigs Street, Augusta, Georgia 30904.

FOR SALE OR TRADE

FOR SALE: Top portion of Westinghouse binding posts to fit the Aeriolas, Jr. and Sr., the RS and Aeriola Amplifiers. These also fit the RADA and others. $1.00 each, $10.00 per dozen. Bottom portion available upon request. Radio cabinets for the Crosley 50 and 51. Completely assembled with all hardware but unfinished..$16.00 which includes shipping. Cabinets for the Aeriolas and the Amplifiers. Completely assembled with all hardware but unfinished... $20.00 which includes shipping. Many, many other items coming. Roland Matson, 388 Concord Road, Bedford, Mass. 01730, Phone (617) 663 3877.

FOR SALE OR TRADE: RARE TUBE REPLACEMENTS - 1940 STYLE
WD11A $15; WD11R $10; V99R $7; V20R $7; X99R $5; X20R $5;
"A"--means newer type,
"R"--means replacement type.
Will trade tubes or Riders 3 to 14 for: Riders Vol's 23, 21, 20, 17 and index needed. K. Hanson, 3403 E. Broadway, Long Beach California 90803.

FOR SALE: "Modern Electric's" 1908 to 1913. Total 33 copies. Extra fine condition. Sell one or all. Val Armbruster, 1408½ Playford, Grants Pass, Oregon 97526. Phone: 503 476-7185.

1930-1948 reproduced schematics for radios, alignment included. TV also. Send $2.50 to Antakamatics, %James Antaki, 311 Bearridge Road, Pleasantvill NY 10570.

FOR SALE: Solid-State power supply provides most needed "A", "B" and "C" voltages. Send SASE for special sheet. G. B. Schneider, 6848 Commonwealth, Parma Hgts, Ohio 44130.

$1.00 for the newly published booklet "A Pocket Guide to Antique Radio Collecting." Antique Radio Press, Box 42, Rossville IN 46065.

FOR SALE OR TRADE

FOR SALE: Cassettes or reel to reel tapes of old time radio shows. Once again hear The Shadow, Amos and Andy, Al Jolson. Whatever your taste comedy, drama, western, variety, I have it all. Send $1.00 (one dollar) for catalog to: Stuart Weiss, 136-49 Jewel Avenue, Flushing, New York 11367.

FOR SALE OR TRADE: OLD STYLE CLOTH COVERED POWER CORD. Exact same 2-conductor wire as used on Radios, Lamps of the twenties and thirties: Brown, Gold or Ivory parallel conductor. Also Green/Yellow twisted pair. 20¢/foot or $16.00/100' (assorted OK). Add $1.00 Postage and Handling. SASE for samples. Robert Goodman, 7943 Ponce Ave., Canoga Park CA 91304.

FOR SALE: Radiola V crystal detector driving three tube amplifier with UV 199 tubes and adaptors. Two stage amplicication, Brass case finished in wood grain paint. Best offer over $125.00 takes it. Also Crosley 51 with tubes at $65.00 plus shipping. Bud Weatherford, 332, 5th Ave. East Cresco IA 52136. Phone 319 547 2210.

FOR SALE: 5T4, 6A8, 6N6, 7B6 and 6C8, and other used tubes 50¢ each. Assorted rotary switches 10 for $1.00. Assorted tubular electrolytic capacitors 10 for $1.00. Clock radio timers 2 for $1.00. Output transformers 4 for $1.00. Assorted fuses 60 for $1.00. Assorted tubular condensers 30 for $1.00. Elmer Nelson, 824 So. Pleasent St., Princeton IL 61356.

SALE OR TRADE: Several hundred battery radios, speakers, etc. Deforest, Grebe, Federal, Tuska, Paragon, Kennedy, etc,
WANTED: Early Grebe CR equipment. Photos availabel. Glen S. Streeter, 26008 Crenshaw Blvd. #106D, Torrance, California 90505. Phone: (213) 541 3279.

FOR SALE: 2000 assorted Radio Magazines, Books, Radio paper items, ask for list # R-P-3-77 send 50¢ and long SASE. Frank Krantz, 100 Osage Ave., Somerdale N. J. 08083.

WD11 Adaptors, use UX199, 120, VT24. No wiring changes, Radiola III's battery hook up included $5.25 pp., 2 for $9.25. Keith Parry, 17557 Horace St., Granada Hills CA 91344.

FOR SALE: Hard cover copies of "Radio Trouble Finder," 1926 50p. $6.00: "Radio Questions Answered," 1924 45p. $6.00: "150 Radio Hook-ups," 1930 65p. $10.00. A. Nolf, 620 Auburn Cr., Burlington, Ont. Canada L7L 5B2. Money orders only.

FOR SALE: New list of radios, parts, etc. will be ready March 15. Send SASE for list. Burt Noyes, 4 Pinewood Dr., Stratham N.H. 03885.

FOR SALE OR TRADE

FOR SALE: RCA regenoflex $165. Browning-Drake complete with factory bakelite chassis $75. Pathe' slant front with original McCullough 401 tubes and wiring harness $175. Crosley slant front Trirdyn Specils $90. All in fine shape. C. Byrnes, 20975 Valley Green Drive, #290, Cupertino CA 95014.

FOR SALE OR TRADE: "Wireless World Magazine," 106 issues 1922-3-4. Offer or $200. "Radio Review," 30 issues bound 1919-1922 offer or $75.00. Sell or trade for radios. Merrill W. Bancroft, 169 South Row Road, Townsend, Mass. 01469.

WANTED

WANTED: Any radio fan magazines. Also, any radio magazine with commercial broadcast or star information. Examples: "Radio Guide, Radio Stars, Radio-TV Mirror," etc. Also "Photoplay" magazines. 1 or 100. Fred L. Davis, 5106 Skippy Street, Memphis, Tennessee 38116.

WANTED: Service manual and schematic for Dumont Oscilloscope model 327, serial NO. 2X03. This is the large professional Scope, Scope uses tubes and has printed circuits. Will pay Top Dollar. Ralph G. Maddox, Purgitsville W VA 26852.

WANTED: Scott, McMurdo Silver, Lincoln, and other classic receivers. Also pre-1930 battery sets, speakers, mikes, etc. J. E. Cunningham, 23W 675 Ardmore, Roselle, Ill. 60172.

WANTED: Automotive radios, parts, literature, vibrators, associated items, pay cash. Marvin Roth, 14500 LaBelle, Oak Park MI 48237.

WANTED: A speaker for an American Bosch Magneto Radio model 28. J. Gregorich, 117 - 2nd. St. No. Virginia, Minn. 55792.

WANTED: Speaker for Zenith model VII. George W. Byrd, Sr., 14 N. Bridge St. Highland Springs VA 23075.

WANTED: One good audio transformer for Radiola III (Canadian). Atwater Kent 55 (Early) tuning control. Darcy Brownrigg, Chelsea, Quebec JOX INO Canada.

WANTED: "Radio News" for 1919, 1922. "CQ" 1945. Driver and base for Atwater-Kent L and Brandes horns. R. McNeill, Box 472, Yorkton, Sask. CANADA S3N 2W4.

WANTED: Breadboards, crystal sets, wooden horn speakers - manufactured. Private collector. Rosenthal, 507 S. Maryland Ave., Wilmington, DE 19804.

WANTED: Frequency indicator plate and wheel for Radiola 60 or Grabar 330. Riders Volume I or Cunningham Edition. Harbeck, 1316 - 38th St., Sioux City, Iowa 51104.

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1A4	$4	1H6	$4	2A3	$7	6A4	$6	6A7	$5	6D6	$4	6SA7	$3	7C5	$3
1A5	$4	1J6	$4	2A4	$5	6A5	$4	6AB4	$3	6D7	$4	6SB7	$3	7C6	$4
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1B4	$4	1LA6	$4	2A7	$5	6AB4	$3	6AC7	$3	6E6	$4	6SF5	$3	7E7	$4
1B5	$4	1LB4	$4	2B7	$4	6AB7	$3	6AK5	$2	6E7	$4	6SF7	$3	7F8	$5
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								6K8	$4						
								6L5	$4						
								6L6	$3						
								6L7	$4						
								6N5	$5						
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14F8	$4	39	$3												
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